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Preliminary statement
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SOCIOECONOMIC DETERMINANTS OF PROPERTY CRIME: THE CASE OF SLOVENIA

The first longitudinal study of this type in Slovenia addresses economic and social causes of crime and tries to determinate their significance in criminal behaviour through development of an empirical model that analyzes criminal behaviour in Slovenia by using time series data for period of 1963 till 2007. Theoretical framework implies that besides institutional environment and social structure economic situation importantly determines the level of crime in society. Econometric analysis uses variables that represent determinants of crime: economic conditions, probability of conviction and, additionally to the basic model, share of young males in the population and dummy variable that represents some of the peculiarities in the transition period in Slovenia. Empirical findings are in accordance with the theoretical framework.

Key words: social causes of crime, economic theory of crime, property crime, criminology, Slovenia

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1. Introduction

Crime can be considered as a result of multiple adverse social, economic, cultural and family conditions. Different theories give emphasis to different factors and besides that the importance of those factors differs between different types of crimes. "The economic theory of crime is a micro-theory which, postulating that a welfare maximizing individual optimally allocates resources according to relative returns, links socioeconomic conditions to the individual's relative returns to legal and illegal activity." (Allen, 1996: 293). Economic situation has been understood as one of the factors explaining criminal behaviour already for centuries. Particular approach of economic explanation of crime was taken by Becker (1968). He explains criminal act as a result of a maximization problem in which agents compare the costs and the benefits of legal and illegal activities taking into account the probability of being arrested and punished and the expected returns from crime. Following these theories economic determinants can be regarded as an important factor when researching crime, especially if the type of crime is largely determined by economic situation, such as property crime.

The present paper addresses economic and social causes of crime in Slovenia and tries to determinate their significance in criminal behaviour through development of an empirical model that analyzes criminal behaviour by using time series data for period of 1963 till 2007. It represents a unique research for Slovenia and central European countries in general, since most of the empiric econometric studies of this type have been exploring Common law countries, especially United States, and only in recent years some continental European countries.

The paper is structured as follows: chapter Property Crime and Criminal Law gives a theoretical overview for further analysis highlighting economic explanations of crime. It also describes Slovenian criminal legislation and its changes through the analyzed period with special emphasis on chapter on crimes against property. Also some stylized facts on property crime in Slovenia and overview of studies analyzing property crime are given. Next chapter describes the formation of the model and explains selection of variables. Fourth chapter explains the methodology and presents the results of the regression analysis.

2. Property crime and criminal law

2.1. Theoretical overview

Crime is a special social phenomenon, which moves according to its own laws as well as according to general laws of social movements and processes.

Social relations and conditions largely determine number of criminal offences, structure of offenders, their social status, education as well as methods of committing crimes (Bavcon and Šelih, 1999). There are several adverse social, economic, cultural and family factors that contribute to the fact that an individual becomes a criminal. Also theories explaining criminal behaviour can be divided into different groups according to the most important contributing factor.

Social control theory suggests that the process of socialization and social learning is the most important for building self-control and reducing participation in the behaviour that can be considered as delinquent. Individuals are, in accordance with Hobbesian assumption, naturally capable of committing criminal acts (Hobbes, 1964). Values, norms, and beliefs formed during socialization contribute to conforming behaviour, while, according to Hirschi (1969), delinquents fail to form, or maintain a bond to society consisting of attachment, commitment, involvement and belief (Wiatrowski et al., 1981).

Social structure theories give emphasis on environment of an individual that decisively determines his behaviour. According to the institutional anomie crime represents a form of social dysfunction. The idea is associated with the Durkheim's notion of *anomie* - feelings of alienation among individuals arising from discrepancy between culturally learned economic ambitions and the prospects of realizing those ambitions in a population that results in the act of suicide (Durkheim, 1951). Merton (1938) modified the theory in order to explain variations in crime and deviant behaviour. When wealth and economic well-being are recognized as symbol of success for the population at large while its social structure rigorously restricts or completely eliminates access to approved modes of acquiring these symbols for a considerable part of the same population, then an antisocial and also criminal conduct represents a normal outcome. Social factors used as an explanation in this theory are tightly connected to the level of economic development in a society.

Different type of economic theory is based on utilitarian principle that people maximize their level of utility. People act to improve their present state; they behave rationally, which means that their behaviour is the result of carefully made decisions. In order to be considered rational ranking of different deeds must be complete, transitive and reflexive (Cooter and Ulen, 2004). Result of such a decision making process is an intelligent, productive and justifiable choice (Luksetich and White, 1982). Focus is given to the element of personal choice, understanding of which is commonly based in a conception of rational choice. Rational choice theory, also known as rational action theory is rooted in the analysis of human behaviour developed by the early classical theorists, Cesare Beccaria (2002)[1] and Jeremy Bentham (1996).

[1] Beccaria's views formed the fundations for the classical theory of crime and influenced movements for abolition of cruel and unusual punishments in the late eighteenth and early nineteenth

Rationality implies that some individuals become criminals because financial and other rewards from crime exceed the rewards originating from legal activities, taking into account of the likelihood of apprehension and conviction, and the severity of punishment (Becker, 2005). "According to this view, law-violating behavior should be viewed as an event that occurs when an offender decides to risk violating the law after considering his or her own personal situation (need for money, personal values, learning experiences) and situational factors (how well a target is protected, how affluent the neighborhood is, how efficient the local police happen to be). Before choosing to commit a crime, the reasoning criminal evaluates the risk of apprehension, the seriousness of the expected punishment, the value of the criminal enterprise, and his or her immediate need for criminal gain." (Siegel, 1992: 131)

On the other hand, as proposed by social control theory, majority of people does not commit crimes regardless the potential profit and small risk of being detected. They are constrained by moral and ethical considerations, which, in accordance with subjective rational choice theory, represent their costs. Economic theory identifies criminal behaviour as a reaction to expected costs and expected benefits. Therefore anticrime policy should be focused on reducing benefits from criminal activities and/or increasing the expected costs (Luksetich and White, 1982). The later includes also adequate socialization that increases "bad conscience costs".

Despite the apparent contradiction between institutional anomie view and the rational choice theory there is no necessary inconsistency between them. When developing a model of criminal behaviour in a society[2] all of the presented theories have been used. Its impact will be presented further on in the text when rationale for individual variables is given.

2.2. Criminal law in Slovenia

Criminal conduct is behaviour that is set out by constitutionally determined legislative organs as criminal after considering special criteria and after being determined in appropriate legal acts. Slovenian legal system recognizes breaches of discipline (severe breaches of work responsibilities), offences and criminal offences. The latter are human conducts considered as important or major violations of valid orders and prohibitions either by society as a whole or by the current state authorities (Bavcon and Šelih, 1999).

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century, such as the introduction of the Eighth Amendment in the Constitution of the United States of America.

[2] Individual (personal) characteristics cannot be modeled in this type of analysis, but it could be interesting to incorporate so called "national characteristics" in a cross-country study.

In the period between1963 and 2007 three basic "sets" of criminal legislation were valid on the territory of Slovenia. Penal code of Socialist Federative Republic of Yugoslavia[3] (Sl. list SFRJ 13/1951, 11/1962, 31/1962, 15/1965, and 20/1969) was valid between 1951, therefore from the beginning of the period analyzed, and 1977. Chapter XX. on crimes against social and private property included larceny, great larceny, larceny in the form of robbery, robbery, embezzlement, joy riding,[4] unlawful appropriation of another's goods, malicious mischief, imprudent keeping of social property, fraud, breach of trust, extortion and blackmail, usury, violation of rights of other person, damage or destruction of archival material and concealment.

In 1977 Slovenia got its own penal code (Penal Code of Socialist Republic of Slovenia[5]; Ur.l. SRS 12/1977) for the first time in history. It included only specific offences while most of general provisions remained to be contained in the newly passed Penal Code of SFRY from 1976[6] (Sl. list SFRJ 44/1976). No major changes occurred in the descriptions of crimes. Some new crimes were included in the penal code, while some of them were eliminated.[7] Damage or destruction of archival material was replaced and broadened with illegal export and import of goods of special cultural or historical significance, outstanding natural features, or endangered species of animals and plants contrary to the principles of international law, as well as unlawful damaging or destruction of goods of special cultural significance, outstanding natural feature, other protected natural resources or a public resource. Arson, damaging of dwellings and business buildings and premises and unlawful occupation of dwelling belonging to another were introduced while special (stricter) treatment of some crimes if they were committed against social property was eliminated.

According to the statistics omitted and newly included crimes represent a minority of all crimes. General trend that can be noticed is that punishments become less severe, which can be noted when examining the Penal Code of Republic of Slovenia[8] valid from 1995 (Ur.l. RS 95/2004). On the other hand, except some modernisations[9] descriptions of property crimes have not changed much. New Penal Code[10] is valid from November 2008 (Ur.l. RS 55/2008).

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[3] Krivični zakonik SFRJ

[4] Unlawful taking of another's motor vehicle with the intention of use and not appropriation.

[5] Kazenski zakon SRS

[6] Osnovni krivični zakon SFRJ

[7] For more detailed analysis compare Chapter XX., Articles 249. -267. of The Penal Code of SFRY with Chapter XV., Articles 165.-185. of The Penal Code of SRS.

[8] Kazenski zakonik – uradno prečiščeno besedilo (KZ-UPB1). Criminal offences against property are contained in Chapter XXIII., Articles 211-230.

[9] For example, crime of Damaging of Computer Data and programs (Article 225, KZ-UPB) was introduced.

[10] Kazenski zakonik (KZ1)

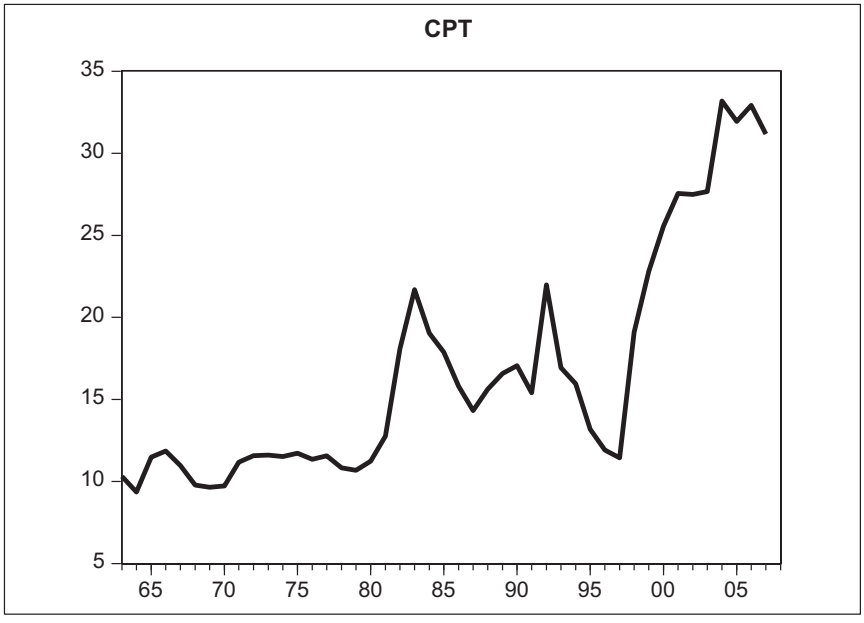
2.3. Some stylized facts about property crime in Slovenia

Crime per thousand inhabitants is the most appropriate measure of crime, since it enables intertemporal (and also interstate) comparison, especially when the time dimension is large and number of inhabitants alters.

Figure 1 shows that the crime situation was rather stable in the sixties and seventies. On the other hand, structure of recorded criminal activity in Slovenia shows significant changes in the eighties. Criminal offences against property started to increase and reached its highest level at the beginning of the nineties number. On the other hand the number of convictions fell (Bavcon and Šelih, 1999). Further, figures show that the number of offences fell later on in the nineties but not because the level of criminal offence would have fallen but mostly because crimes were not detected by the police or because minor offences where not investigated (Brinc, 2005), which is considered to be a common situation in transition countries (Lotspeich, 1995). After 1995 number of reported crimes increased again. This could be ascribed to changes in the interpretation of crimes prosecuted upon proposal of a victim.

Figure 1:

PROPERTY CRIMES PER THOUSAND INHABITANTS IN SLOVENIA IN THE PERIOD 1963-2007.



Source: SURS, own.

3. Empirical analysis

3.1. Empirical literature overview, variable and data choice

This paper represents a unique longitudinal study for Slovenia, since use of econometric methodology is very scarce in Slovenian criminological literature. Therefore Slovenian statistical and econometric studies will be presented at the beginning of this chapter while other (foreign) empirical literature overview will be given when presenting variables that were chosen for the study.

Tompa's recent econometric study has explored relationship between inequality and crime using panel data analysis. Four years of data for eleven police counties have been used (Tompa, 2008). The analysis concludes that policy should be oriented towards reduction of inequality since this would also lower property crime rates. Brinc analyzed movement of total crime rates and criminal policy in Slovenia in the period of 1980-2007 and found out that the number of criminal offences reported to the police increased two and a half fold, while the number of convicted persons decreased by more than one third. Sentencing policy was rather mild, which is a reflection of less serious criminal offences and of the orientation of the criminal justice system (Brinc, 2005).

Variables chosen (Table 1) for the model of criminal activity in Slovenia between the years 1963 and 2007 are selected according to theoretical findings explained in the previous section and available data series that represent a major constraint to the analysis. Statistical Yearbook, police and judicial statistics have been used as sources of data. Precise explanation of usage of particular variables will be given in the following text.

Table 1:

VARIABLE DESCRIPTIONS

CPT	Number of committed crimes against property per thousand inhabitants
GDP	Gross domestic product per capita in real figures, base year 2007
U	Unemployment as a percentage of unemployed in the whole population
CONV	Probability of convictions - number of convicts per thousand committed crimes
YM	Share of young males in the population
DUMMY	Dummy variable, takes 1 between years 1993 and 1998, 0 otherwise

Source: own

3.1.1. Number and types of criminal offences

Number of committed crimes can be estimated either from number of crimes detected by the police, by number of indictments filed or from number of cases tried in courts. On the other hand none of those sources gives accurate data, since a large portion of crimes remain unreported or uninvestigated (Bavcon and Šelih, 1999). Also, statistical registration of criminal acts and the attitude towards so called petty crimes, changes over time. (Scorcu and Cellini, 1998). This analysis uses number of crimes detected by the police as the proxy for number of committed crimes, which is in accordance with the literature (Denny et al., 2004). Choice is appropriate because it shows the number of committed crimes best, while number of cases tried in courts better reveal the number of perpetrators captured.

The analysis is limited to crimes from the chapter of Crimes against Property contained in Penal Codes that have been valid in Slovenian territory from 1963 until 2007. Although description of crimes have been changing throughout the analyzed forty years as was presented in the first section it is reasonable to take them as a group of substitutes, especially because incriminations follow the development of society. Those criminal offences have certain similarities upon which the legislator put them in the same chapter. In the past statistics differentiated between offences against social property and offences against individual property. Those qualifications are ignored, since it is reasonable to believe that criminals did not differentiate between types of property. It would be appropriate to take also some offences from the group of criminal offences against economy and eliminate some criminal offences against property, but this would cause inconsistency between the data, since number of convictions is not registered separately for each type of offence but only for groups of offence from the same chapter.

In order to correct changes in number of inhabitants (Hellman, 1980) the level of crime is defined as the ratio of the number of offences to the level of population, precisely: number of criminal offences against property per thousand inhabitants.

3.1.2. Economic and social conditions

Rational, amoral criminals respond to the opportunity costs of crime. An increase in the opportunities for earning income legally should cause a decrease in criminality. Including anomie in a model would be very beneficial, but unfortunately data on indicators of anomie identified in the literature, such as level of suicide or the level of inequality (Denny et al., 2004) are either non-existent or

non-consistent. But also unemployment can act as a proxy for the presence of anomie in the society, because better economic situation reduces frustration suffered by the deprivileged as described in the institutional anomie theory.

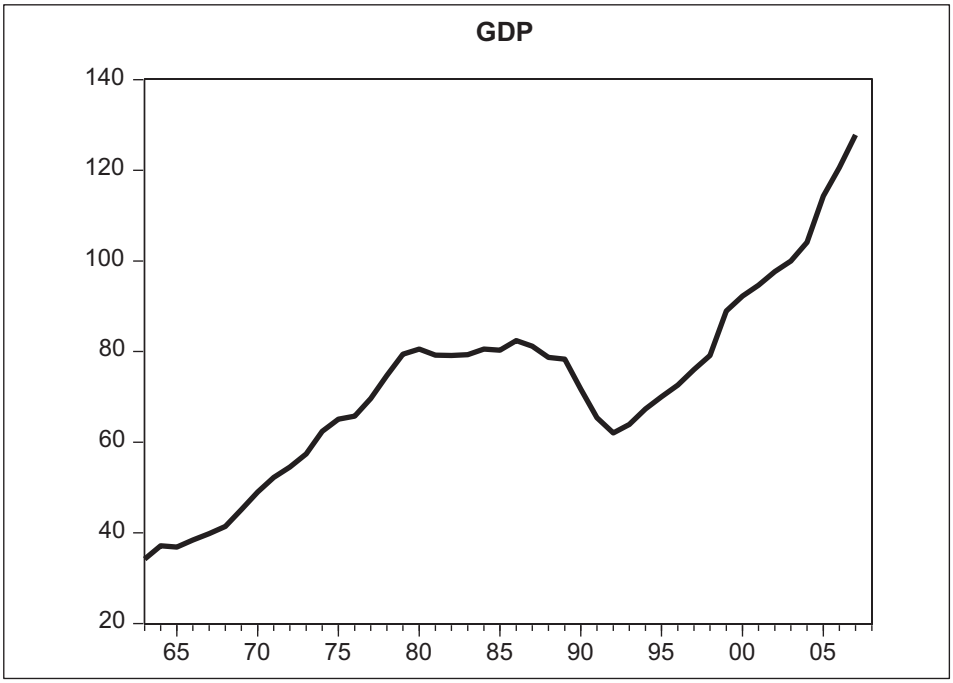
Ameliorating economic and social conditions is therefore not only theoretically, but also empirically identified among the best policies for reducing the amount of crime (Cooter and Ulen, 2004). Very different proxies for factors that influence costs and benefits of criminal activity have been used. Comprehensive overview of income variables used in the economic studies of crime has been given in Chisholm and Choe (2005). According to their article different authors used median income, median family income, mean family income and labour income to manufacturing workers as proxy for benefits of legal activities (Chisholm and Choe, 2005). Deadman and Pyle used the real GDP and real consumer's expenditures and discovered that there exists inverse relationship between recorded crime and both of the economic indicators (Deadman and Pyle, 1997). Besides that unemployment rate, employment, size of labour force, earnings, consumption and poverty has been among the proxies used. The relationship between crime and the labour market and education has been a major issue in the UK and US research. Perhaps unemployed workers commit crimes to gain income or to deal with their idle time and frustration, so that worsening employment conditions lead to an increase in the amount of property crimes (Cooter and Ulen, 2004). Analysis of Imrohoroglu and colleagues showed that approximately 16% of unemployed and only 5% of employed people in USA engaged in criminal activity, which suggests that unemployment can represent an important determinant of criminal activity, especially when considering property crimes (Imrohoroglu et al., 2006). Raphael and Winter-Ebmer have found large positive effects of unemployment on crime (Raphael and Winter-Ebmer, 1998). On the other hand some studies explored also reverse causality – impact of crime on unemployment. Calvó-Armengol and Zenou argue that involvement in criminal behaviour deteriorates the network of personal contacts, reduces the accessibility of unemployed workers to existing job opportunities, exacerbates labour market frictions and, therefore, increases unemployment, which is plausible, but if demand for labour is high involvement in criminal actions represents only a minor obstacle for employers (Calvó-Armengol and Zenou, 2003).

Also Whittaker in his report showed that crime is strongly associated with bad economic conditions (Whittaker, 1985). Other researches show the opposite effect of changes in economic conditions – worsening of economic conditions worsens also the opportunities for crime and lowers its yields (Cooter and Ulen, 2004). Fowles and Merva concluded that in the USA in the analyzed period of 1975-1990 level of poverty represented an important structural covariate of all types of criminal activity (Fowles and Merva, 1996). Similar conclusion can be drawn for changes in unemployment which are positively correlated with most of

the analyzed (property and non-property) crimes. On the contrary, increase in the level of wage inequality did not affect the level of property crime.

Figure 2a:

GDP PER CAPITA THROUGH PERIOD 1963-2007.



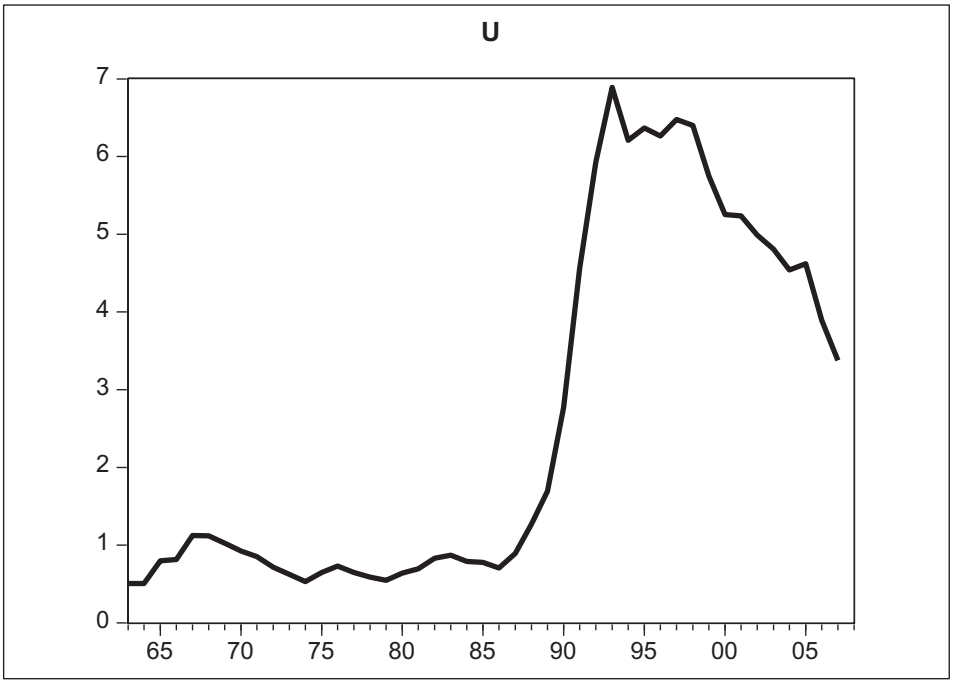
Source: SURS, own.

When considering the appropriate variable for analysis of crime in Slovenia peculiarities of Slovenian labour market and society before transition and availability of data for the analyzed period have to be considered. Economic conditions in this model are represented by unemployment rate calculated as share of unemployed in the whole population since the data on labour force are not available. Figure 2a shows that after 1990 previously hidden unemployment became revealed and official number of unemployed increased drastically (Bajt and Štiblar, 2004).

Worsening of the economic situation in transition period is expressed in Figure 2b, depicting real GDP level as well.

Figure 2b:

PERCENTAGE OF PEOPLE IN THE POPULATION OFFICIALLY REGISTERED AS UNEMPLOYED IN THE PERIOD 1963-2007.



Source: SURS, own.

Variable is used as lagged, since it is possible to assume that increased unemployment does not cause immediate worsening of economic conditions and redirection to criminal activity (Gujarati, 2003). People become criminals after they spend stockpile from good times.[11] GDP per capita, expressed as an index with the base in the year 2007, has been used in the second equation.

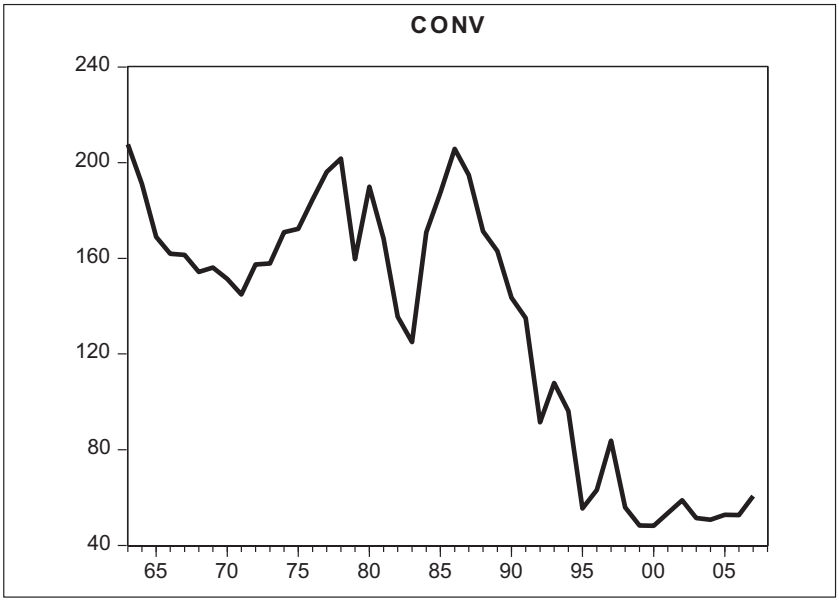
[11] Unemployment support or other accumulations made during employment period.

3.1.3. Probability of Conviction

Several studies (more in: Trumbull, 1989) have shown that offenders respond more to a given proportional increase in the probability of punishment than they do to the same proportionate increase in severity of punishment. Therefore the later variable was not included in the model. Methods for measuring the probability of conviction differ between studies. Very common is the usage of number of convictions divided by the number of recorded crimes. Although this method could introduce bias into results as number of authors has pointed out,[12] use of such variable in models explaining recorded crime is almost universal. Besides that, method of dividing nationally estimated number of persons arrested by the nationally estimated total number of persons allegedly committing crime that year also appears, but it proved to be inappropriate due to lack of data. Perceptions of criminals are created when they are acquainted with the number of convicts (for example through the media) and compare them with number of crimes reported in the media.

Figure 3:

PROBABILITY OF CONVICTION THROUGH YEARS 1963-2007.



Source: Judicial statistics, SURS, own.

[12] Deadman and Pyle mention Ehrlich, Klein, Nagin, Taylor (Deadman and Pyle, 1997).

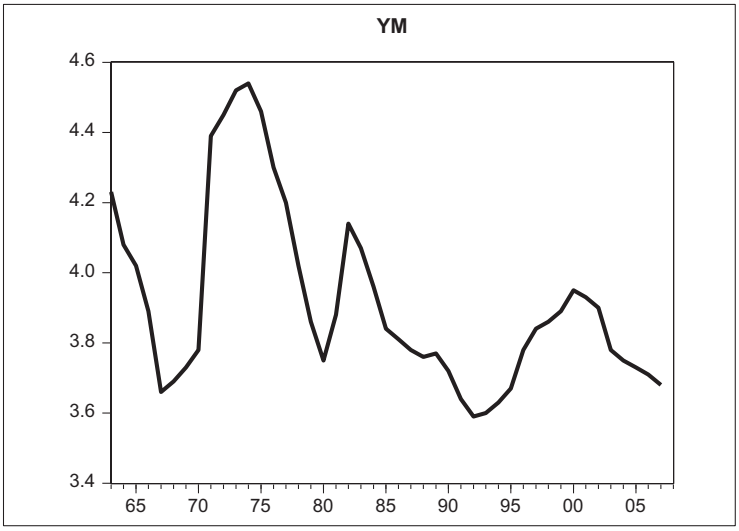
Figure 3 shows that the number of convictions per thousand committed crimes[13] fell sharply at the beginning of the 1990's. Average ratio between solved and new cases[14] in the period between 1985 and 1996 was 0.96, while in the sub-period of 1993-1996 it fell to 0.875 (Mencinger 1997).

3.1.4. Share of Young Males in the Population

The effect of age on crime has been analyzed many times because of the observed inverted J-curve relating crime and age. Several analyses have shown that most crimes are committed by young males (Cooter and Ulen, 2004). Freeman (1996) showed that in the USA disproportionately high share of young males commit crimes.

Figure 4:

SHARE OF YOUNG MALES IN THE POPULATION
THROUGH PERIOD 1963-2007.



Source: SURS, own.

[13] Number of committed crimes as reported by the police is not the same as cases tried in courts, not only because some of the denunciations are unfounded but also because some of the procedures against the same perpetrator are united when tried in court. Despite that the proxy for probability of conviction should be appropriate.

[14] This number includes all cases (not only criminal) tried before Slovenian courts.

Grogger concluded that young men are responsive to wage incentives and that decreases in real wages may have played an important role in the increase in youth crime during the 1970s and 1980s (Grogger, 1998). Analysis of burglary in Ireland showed that share of young males in the adult population has a positive effect on crime both in the long and in the short run (Denny et al., 2004).

Share of young males aged 20 to 24[15] depicted in Figure 4 has been used as data for the variable "share of young males in the population". This age group has been selected due to similar age grouping used in some other analyses (Denny at al., 2004) and (Wilson and Daly, 1985), as well as due to limitations of the available data. Large share of crimes are committed by minors; however use of this data would not be appropriate because treatment of underage offenders is significantly different from treatment of other offenders. Variable "probability of conviction" includes only data on adult offenders' convictions as well.

3.1.5. Dummy variable

Specifics that are connected with transition period are problems of law enforcement, the changing nature of regulation over economic activity, deterioration of economic conditions, the incomplete nature of economic reforms and features of the social psychology (Lotspeich, 1995). Some of the mentioned characteristics will be described further in the text, while others have already been explained as a part of other explanatory variables.

Particularity of situation is confirmed by data on structure of crime in Slovenia. In the beginning of the nineties number of crimes against property documented by the police increased, on the other hand the number of convicts fell (Bavcon and Šelih, 1999). In the following years number of detected crimes decreased sharply. Although some of these changes may be explained by other variables that have already been described,[16] it is possible to assume that disintegration of police and law enforcement authorities after 1990 are one of the reasons for lowered level of detected crimes (Bavcon and Šelih, 1999). Number of reported crimes per one policeman and crime investigator started falling in 1993 after reaching its highest level of 9.7 in 1992 to its lowest level of 5.8 in

[15] Share of young males at the beginning of the period analysed in the article has been constructed from the subsequent census data since the yearly data for the period 1964-1971 are not available.

[16] Increase at the beginning of the nineties can be explained by change in economic conditions and lowered probability of conviction.

years 1996 and 1997. After that period it started growing again (Brinc, 2005). Legislation can be accommodated to the changed economic system relatively fast, but effectiveness requires the persons functioning in the system to adopt an outlook quite different from that of their previous experience and education. A period of confusion and ineffective enforcement of contract law and property protection can be expected, which makes criminal activity more attractive by reducing the probability of detection and conviction (Lotspeich, 1995). Reform of judiciary that was carried out at the beginning of the nineties contributed to a great increase of judicial arrears and therefore also decreased the probability of conviction (Vlada Republike Slovenije and Vrhovno sodišče Republike Slovenije, 2005) as noted in the Figure 3.

Economic crisis represents a disturbing event which changes values of the society (Durkheim 1951). This can encourage criminal activity, since it becomes more widely accepted and tolerated, meaning that costs of criminal acts as perceived by individuals are reduced. Escape from reality becomes a common response to described circumstances, which is confirmed for Slovenia by increased number of drug abusers and drug related crimes in the nineties. Growth rates of drug related crimes have been decreasing since 1998.

Described peculiarities of the period are covered by dummy variable, which has a value of one in the period between 1993 and 1997 and a value of zero otherwise (in the periods of 1963-1992 and 1998-2007). Expected sign of the variable is ambiguous and depends on the effect that prevails – lower police detection rates or increased crime rates due to specifics of transition period.

3.2. Methodology and results of regression

Besides complying with theoretical findings choice of a model has to be in accordance with econometric and statistical theory concerning estimation of time series relationships.

Autoregressive model (AR(1)) was used to explain the relationship between number of crimes per thousand inhabitants as a dependent variable and lagged value of the dependant variable, unemployment, probability of conviction, share of young males and dummy variable as explanatory variables. Non-stationarity was detected in series of GDP, U and CPT Therefore first differences or first differences of logs of variables were used.

Based on theoretical conclusions, data availability and statistical theory the following models were chosen:

Equation 1:

$$dlog(CPT)=b_1+b_2dlog(CPT(t-1))+b_3d(U(t-1))+b_4d(CONV)+ +b_5d(YM)+b_6(DUMMY)+e$$

Equation 2:

$$dlog(CPT)=b_1+b_2dlog(CPT(t-1))+b_3dlog(GDP(t-1))+ +b_4d(CONV)+b_5d(YM)+b_6(DUMMY)+e$$

Table 2:

RESULTS OF ECONOMETRIC ANALYSIS – 1.)
MODEL WITH UNEMPLOYMENT

Dependent Variable: DLOG(CPT)
Method: Least Squares
Date: 09/08/09 Time: 22:05
Sample (adjusted): 1966 2007
Included observations: 42 after adjustments
Convergence achieved after 33 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.037352	0.038811	0.962392	0.3423
D(U(-1))	0.103215	0.046220	2.233130	0.0318
DUMMY	-0.305848	0.080483	-3.800156	0.0005
D(CONV)	-0.002961	0.000813	-3.642203	0.0008
D(YM)	0.062871	0.026665	2.357775	0.0239
AR(1)	0.556877	0.145197	3.835311	0.0005
R-squared	0.525423	Mean dependent var		0.023778
Adjusted R-squared	0.459510	S.D. dependent var		0.145103
S.E. of regression	0.106677	Akaike info criterion		-1.506468
Sum squared resid	0.409676	Schwarz criterion		-1.258229
Log likelihood	37.63582	Hannan-Quinn criter.		-1.415478
F-statistic	7.971415	Durbin-Watson stat		2.069249
Prob(F-statistic)	0.000039			
Inverted AR Roots	.56			

Model with unemployment (Table 2),[17] probability of conviction, share of young males and dummy as explanatory variables fulfills basic econometric pre-

[17] First differences have been used since nonstationarity was detected.

sumptions. According to Granger causality test no multicolinearity that would need to be eliminated is present and White heteroskedasticity test showed that no heteroscedasticity exists. Breusch-Godfrey LM test did not indicate presence of serial correlation. All of the variables are statistically significant and their sign is in accordance with predictions.

Table 3:

RESULTS OF ECONOMETRIC ANALYSIS – 2.) MODEL WITH GDP

Dependent Variable: DLOG(CPT)
Method: Least Squares
Date: 09/08/09 Time: 22:06
Sample (adjusted): 1966 2007
Included observations: 42 after adjustments
Convergence achieved after 16 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.039303	0.031997	1.228345	0.2273
DLOG(GDP(-1))	-0.062033	0.492634	-0.125921	0.9005
DUMMY	-0.237248	0.072950	-3.252214	0.0025
D(CONV)	-0.003253	0.000901	-3.611070	0.0009
D(YM)	0.061094	0.030640	1.993956	0.0538
AR(1)	0.358300	0.156016	2.296555	0.0276
R-squared	0.465555	Mean dependent var		0.023778
Adjusted R-squared	0.391326	S.D. dependent var		0.145103
S.E. of regression	0.113205	Akaike info criterion		-1.387662
Sum squared resid	0.461357	Schwarz criterion		-1.139423
Log likelihood	35.14090	Hannan-Quinn criter.		-1.296673
F-statistic	6.271918	Durbin-Watson stat		2.039492
Prob(F-statistic)	0.000279			
Inverted AR Roots	.36			

If the percentage of unemployed in the previous period[18] increases, the number of committed crimes per thousand inhabitants increases. If the number of convicts per thousand of committed crimes increases, number of committed crimes declines, keeping other variables unchanged. Number of convicts affects number of committed crimes through general and special prevention. Share of young males in the population positively affects level of crime, which is in ac-

[18] Variable has been used as lagged.

cordance with expectations. Dummy variable demonstrates that number of committed crimes in the period of 1993-1998 was in average lower than before and after this period, which is a bit surprising, since general popular opinion is that number of committed crimes increased after 1991, but can be explained with peculiarities of transition period, especially with the fact that number of crimes detected by the police fell.

Variable GDP has been used instead of unemployment in the second model (Table 3). Variables dlog(GDP) has turned out to be statistically insignificant, but all of the explanatory variables have sign in accordance with expectations.

4. CONCLUSIONS AND GUIDELINES FOR FURTHER RESEARCH

Theoretical framework suggests that economic causes can contribute a lot to the explanation of number of property crimes perpetrated in a society. This outline is of great importance for transition countries that experienced sudden deterioration of economic situation, increase of inequality among its citizens and fast building of new institutions that are not necessarily efficient. This empirical analysis confirmed main theoretical findings; therefore it is possible to conclude that number of committed and discovered crimes in Slovenia depends on economic conditions, efficiency of police and courts and on the share of young males in the population.

The present analysis is first of this type for Slovenia and it brings important guidelines for anti-crime policy. Quality of research will reach even higher level when a longer time series is available. However, conclusions are already far reaching. If criminal activity depends on the described variables, as econometric analysis has proven, anti-crime policy can influence them and reduce criminal activity. Best anti-crime policy is to improve economic conditions, i.e. to lower unemployment, which enables people to get their own earnings and gives them some sense of usefulness. Anti-crisis measures that were used by several governments, among them also Slovenian, that were targeted to preserving jobs, represent a good anti-crime policy. Due to predicted lowering of wages in the public sector it will be very difficult to improve the efficiency of police and the courts and increase resources for the anti-crime education on minors before they enter the critical age in the following years, although this would be of extreme importance for successful anti-crime policy.

Subsequent analysis should include wider spectre[19] of convicted criminals from Slovenia, as well as from neighbouring countries in transition, especially

[19] E.g. age, sex, ethnicity.

those from the region of former Yugoslavia. Individual (personal) characteristics cannot be modeled in this type of analysis, but it could be interesting to incorporate so called "national characteristics" in such cross-country study. Also, the share of young males might be extended to minors (aged 15-18), and severity of punishment and number of policemen dealing with property crimes could be included into appropriate econometric model. Number of drug addicts might be included as explanatory variable.

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SOCIOEKONOMSKE DETERMINANTE IMOVINSKIH DELIKATA: SLUČAJ SLOVENIJE

Sažetak

Prva longitudinalna studija ovog tipa u Sloveniji istražuje gospodarske i socijalne uzroke kriminala, te pokušava odrediti njihov značaj u kriminalnom ponašanju kroz razvoj empirijskog modela koji analizira kriminalno ponašanje u Sloveniji pomoću vremenskih nizova podataka za razdoblje od 1963. do 2007. godine. Teorijski okvir ukazuje na činjenicu da osim institucionalnog okruženja i socijalne strukture gospodarska situacija značajno određuje razinu kriminala u društvu. Ekonometrijska analiza koristi varijable koje predstavljaju odrednice kriminala: ekonomske uvjete, vjerojatnost osude, te dodatno, za osnovni model, udio mladih muškaraca u stanovništvu. *Dummy* varijabla predstavlja neke od osobitosti u razdoblju tranzicije u Sloveniji. Empirijski nalazi istraživanja u skladu su sa postavljenim teorijskim okvirom.

Ključne riječi: ekonomski uzroci kriminala, imovinski delikti, kriminologija, Slovenija